REMARKS

Claims 1-41 are pending in the present application. Reconsideration is requested.

Rejection of Claims 1-41 as Allegedly Obviousness-Type Double Patenting Over U.S. Patent No. 7,049,433

Claims 1-41 are rejected based on alleged obviousness-type double patenting over claims 1-13 of USP No. 7,049,433. Applicants disagree with this rejection but because no term will be lost, Applicants provide the attached Terminal Disclaimer. The rejection is now moot and withdrawal of the rejection is respectfully requested.

Rejection of Claims 1, 3, 11-14 and 24-41 as Allegedly Obviousness-Type Double Patenting Over U.S. Patent No. 6,693,188

Claims 1, 3, 11-14 and 24-41 based on alleged obviousness-type double patenting over claims 1-15 of USP No. 6,693,188. Applicants disagree with this rejection but because no term will be lost, Applicants provide the attached Terminal Disclaimer. The rejection is now moot and withdrawal of the rejection is respectfully requested.

Rejection of Claims 1-41 as Allegedly Obviousness-Type Double Patenting Over U. S. App. No. 10/382,251

Claims 1-41 are rejected based on alleged obviousness-type double patenting over claims 1-29 of U.S. App. No. 10/382,251. Please note that, although the US PTO has not updated its electronic PAIR file for U.S. App. No. 10/382,251, that application was effectively abandoned as of September 30, 2006. Thus, this rejection is improper and withdrawal of the rejection is respectfully requested.

Rejection of Claims 1-41 under § 102(b) or § 103(a) in view of Yang

Claims 1-41 are rejected under § 102(b) or § 103(a) in view of Yang et al., Chinese Ag. Chem. Society, (1998) 36(6), 555-564. Applicants traverse these rejections.

First, it is important to note that Yang is directed to testing cereal grains for contamination caused by fungus by testing the grains for the presence of chitin. (See, e.g., Yang, introduction paragraph, lines 1-9; we enclose an English translation of Yang.) Chitin is detected by converting the chitin to glucosamine and then testing for glucosamine presence. To convert the chitin to glucosamine Yang teaches use of acid hydrolysis with 10 ml of 10 N HCl reacted at 20°C for 16 hours, followed by dilution and testing using a colorimetric method to detect and quantify any glucosamine that may be present if the grain had been contaminated with fungus. (See, Yang, paragraph 3.)

Claim 1 recites in part, a method of making a glucosamine composition comprising breaking down the cell walls of the fungal biomass to release at least a portion of proteins, lipids and/or polysaccharides therein, *without converting a substantial amount of chitin to glucosamine* and *then converting the chitin* in the fungal biomass to glucosamine.

Yang teaches straight conversion of chitin in the fungus to glucosamine – using a strong acid 10 N HCl for acid hydrolysis. There is no teaching or suggestion in Yang (nor does the Examiner recite any portion of Yang teaching or suggesting) that first, the fungus cell wall be broken down and portions of proteins, lipids and/or polysaccharides therein be released *without converting a substantial amount of chitin to glucosamine* and secondly, converting the chitin to glucosamine. Accordingly, Yang neither teaches nor suggests the method of claim 1.

Claim 2 recites that the cell walls be broken down *without converting a substantial amount of chitin to glucosamine* through use of a mild acid, 0.5 to 12%. There is no teaching or suggestion in Yang (nor does the Examiner recite any portion of Yang teaching or suggesting) of such a preliminary action. Accordingly, in addition to the reason set forth above in relation to claim 1, for this reason as well, claim 2 is allowable over Yang.

Claim 3 recites chitin in the fungal biomass is separated from at least a portion of the proteins, lipids and/or polysaccharides prior to converting the chitin to glucosamine. There is no teaching or suggestion in Yang (nor does the Examiner recite any portion of Yang teaching or suggesting) of such a preliminary step. Accordingly, in addition to the reason set forth above in relation to claim 1, for this reason as well, claim 3 is allowable over Yang.

Claim 4 recites that the first acid comprises 1 to 2% HCl. There is no teaching or suggestion in Yang (nor does the Examiner recite any portion of Yang teaching or suggesting) of such a preliminary action. Accordingly, in addition to the reasons set forth above in relation to claims 1 and 2, for this reason as well, claim 4 is allowable over Yang.

Claim 5 recites breaking down the cell walls of the fungal biomass with a first acidic solution having a concentration of from about 0.05 to 20% at a temperature of from about 60°C to about reflux temperature of a mixture of the fungal biomass and acidic solution. There is no teaching or suggestion in Yang (nor does the Examiner recite any portion of Yang teaching or suggesting) of such a preliminary action. As discussed, Yang teaches use of a strong acid – 10 N HCl – to convert chitin to glucosamine. There is no teaching or suggestion in Yang of initial use of a mild acid (about 0.05 to 20%) to break down fungal cell walls without converting a substantial portion of chitin to glucosamine, followed by use of a stronger acid to convert the chitin to glucosamine. Accordingly, in addition to the reason set forth above in relation to claim 1, for this reason as well, claim 5 is allowable over Yang.

Claims 6 and 7 are allowable for the reasons set forth in relation to claim 1 and based on each of these claims' unique and non-obvious combination of features.

Claim 8 recites that the first acid comprises an acid being less than about 5% acid. There is no teaching or suggestion in Yang (nor does the Examiner recite any portion of Yang teaching or suggesting) of such a step. As discussed, there is no teaching or suggestion in Yang of initial use of a mild acid (5%) to break down fungal cell walls without converting a substantial portion of chitin to glucosamine, followed by use of a stronger acid to convert the chitin to glucosamine. Accordingly, in addition to the reasons set forth above in relation to claims 1 and 2, for this reason as well, claim 8 is allowable over Yang.

Claim 9 recites that the fungal biomass is treated with an alkaline solution prior to breaking down of the cell walls with a first acidic solution. There is no teaching or suggestion in Yang (nor does the Examiner recite any portion of Yang teaching or suggesting) of use of an alkaline solution prior to breaking down cell walls or use of a mild acid to break down cell walls without converting a substantial amount of chitin to glucosamine. Accordingly, in addition to the reasons set forth above in relation to claims 1 and 2, for these reasons as well, claim 9 is allowable over Yang.

Claim 10 recites the method of claim 9 wherein the alkaline solution comprises sodium hydroxide at a concentration of from about 1 to about 4%. There is no teaching or suggestion in Yang (nor does the Examiner recite any portion of Yang teaching or suggesting) of use of an sodium hydroxide prior to breaking down cell walls or use of a mild acid to break down cell walls without converting a substantial amount of chitin to glucosamine. Accordingly, in addition to the reasons set forth above in relation to claims 1 and 2, for these reasons as well, claim 10 is allowable over Yang.

Claims 11, 12 and 14 are allowable for the reasons set forth in relation to claim 1 and based on each of these claims' unique and non-obvious combination of features.

Claim 13 recites that the glucosamine composition contains less than 5 percent glucose. Nothing in Yang teaches or suggests a glucosamine composition having less than 5 percent glucose. Accordingly, in addition to the reason set forth above in relation to claim 1, for this reason as well, claim 13 is allowable over Yang.

Claim 15 is allowable for the same reasons as set forth above in relation to claims 1 and 9. Specifically, there is no teaching or suggestion in Yang (nor does the Examiner recite any portion of Yang teaching or suggesting) of use of an alkaline solution to treat a fungal biomass.

Claims 16- 19 are allowable for the same reasons as set forth above in relation to claim 1 and its dependent claims.

Claim 20 recites in part, a method of obtaining glucosamine from fungal biomass by reacting fungal biomass in an acidic solution with an acid concentration and at a reaction temperature of from about 90°C to about 160°C sufficient to convert chitin to glucosamine *and then separating the glucosamine from the acidic solution.* Nothing in Yang teaches or suggests separating glucosamine from the acid solution. Instead Yang teaches adding water to the acid solution and using that solution to test for the presence of glucosamine. (Yang, paragraph 3.) Since Yang tests for presence of glucosamine using a colorimetric method, Yang has no interest in and thus does not even suggest separating the glucosamine from the acid solution. Furthermore, because the Yang reference is only directed to detecting the presence of a fungus contaminate in grains by converting chitin in any contaminate to glucosamine, Yang does not teach or suggest a method of producing a consumable glucosamine composition. In fact, in preference, there would be no glucosamine detected as there would be no fungus contamination in the grains. Furthermore, Yang does not operate at such high temperatures to convert chitin possibly present in the cereal grains to glucosamine but operates at 20°C. Such high temperatures require expensive and more sophisticated equipment and are unnecessary for Yang's purpose of a simple bench lab test to detect chitin possibly present in a fungal contaminant by converting possibly present chitin to glucosamine and then performing a simple colorimetric lab test. Accordingly, claim 20 is allowable over Yang.

Claim 21 recites a reaction temperature from about 105°C to about 160°C for converting chitin to glucosamine. Nothing in Yang teaches or suggests such a temperature range. For this reason and the reasons set forth above in regard to claim 20, claim 21 is allowable over the Yang reference.

Claim 22 recites reacting of fungal biomass in an acidic solution is performed at a pressure greater than atmospheric pressure. There is no teaching or suggestion in Yang (nor does the Examiner recite any portion of Yang teaching or suggesting) of use of reacting the grains with acid at an increased pressure. Accordingly, in addition to the reasons set forth above in relation to claim 20, for this reason as well, claim 22 is allowable over Yang.

Claim 23 is allowable for each of the reasons set forth in regard to claim 20, 21 and 22.

Claim 24 has been amended to recite a glucosamine composition derived from microbial biomass, including levulinic acid and wherein the composition is suitable for human or animal consumption. Not only does Yang not teach or suggest a glucosamine composition including levulinic acid, Yang does not teach or suggest a glucosamine composition suitable for animal or human consumption. As mentioned above, Yang does not separate the glucosamine from the acid solution (reaction acid being 10 N HCl). The Yang reference teaches converting chitin to glucosamine with a strong acid and then testing such solution for presence of glucosamine to determine whether grains are contaminated with fungus. Yang does not produce a consumable glucosamine composition because neither production of glucosamine in general nor production of a consumable glucosamine composition was of concern or interest to Yang. Yang merely wanted to convert any possibly existing chitin to glucosamine to determine whether cereal grains were contaminated with fungus. Accordingly, claim 24 is allowable over Yang for at least these reasons.

Claim 25 is allowable for the same reasons set forth above in relation to claim 24.

Claim 26 recites the composition of claim 25 further comprising from about 0.001 wt. percent to about 1.0 wt. percent melanoidins. Yang does not teach or suggest a composition including melanoidins. For this reason and those set forth above in relation to claims 24 and 25, claim 26 is allowable over Yang.

Claim 27 has been amended to recite a glucosamine composition derived from a non-animal source, the absence of a muscle protein and wherein the composition is suitable for human or animal consumption. As mentioned above, Yang does not teach or suggest a glucosamine composition suitable for animal or human consumption. Yang does not separate the glucosamine from the very concentrated conversion acid (10 N HCl). The Yang reference teaches converting chitin to glucosamine with a strong acid and then testing such solution for presence of glucosamine to determine whether grains are contaminated with fungus. Yang does not produce a consumable glucosamine composition because neither production of glucosamine nor production of a consumable product was of concern to Yang. Accordingly, claim 27 is allowable over Yang for at least these reasons.

Claim 28 has been amended to recite a glucosamine composition comprising glucosamine, an absence of shellfish allergens and wherein the composition is suitable for human or animal consumption. As mentioned above, Yang does not teach or suggest a glucosamine composition suitable for animal or human consumption. Accordingly, claim 28 is allowable over Yang for at least this reason.

Claims 29-38 are allowable at least for the same reasons set forth above in relation to claims 24-28 (and as to claim 38 – also the argument set forth above in relation to high temperatures in the discussion of claim 20).

Claim 39 recites a composition suitable for human or animal consumption, comprising glucosamine derived from microbial biomass, wherein the glucosamine composition has an oxygen radical absorbance capacity of from about 30 μmole TE/g to about 150 μmole TE/g. Nothing in Yang teaches or suggests a glucosamine composition having melanoidins and thus, likewise, Yang does not teach or suggest a glucosamine composition having an oxygen radical absorbance capacity as claimed herein. As discussed, Yang does not teach or suggest either a glucosamine composition suitable for animal or human consumption nor one with such an oxygen radical absorbance capacity. Yang does not separate the glucosamine from the very concentrated conversion acid (10 N HCl). The Yang reference teaches converting chitin to glucosamine with a strong acid and then testing such solution for presence of glucosamine to determine whether grains are contaminated with fungus. Yang does not produce a consumable glucosamine composition because neither production of glucosamine nor production of a consumable product was of concern to Yang. Accordingly, claim 39 is allowable over Yang for at least these reasons.

Claims 40-41 are allowable at least for the same reasons set forth above in relation to claims 24-39.

Rejection of Claims 24-41 under § 102(a) or § 103(a) in view of Berry

Claims 24-41 are rejected under § 102(b) or § 103(a) in view of Berry et al., U.S. Patent No. 6,372,457. Applicants traverse these rejections.

The Berry reference teaches glucosamine produced by fermentation of genetically modified microorganisms. (see, e.g., Berry Abstract.) Berry neither teaches nor suggests a composition including glucosamine and levulinic acid and/or melanoidins or a glucosamine composition having an oxygen radical absorbance capacity of from about 30 μmole TE/g to about 150 μmole TE/g. The Examiner likewise does not cite any part of Berry even suggesting such compositions. Accordingly, claims 24-26, 29-30 and 32-41 are allowable over Berry.

For at least the reasons set forth above, claims 1-41 are allowable over the art of record and notification to that effect is respectfully requested. If there are any further questions, the Examiner is requested to call the undersigned.

Respectfully submitted,

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